GEOLOGY AND PALÆONTOLOGY.

THE TÆNIODONTA, A NEW GROUP OF EOCENE MAMMALS. — At a recent meeting of the Academy of Natural Sciences of Philadelphia, Professor Cope described the character of some mammalia from the Eocene deposits of New Mexico, obtained by him during the Wheeler Expedition of 1874, which he regarded as allied to the *Insectivora*. The feet are armed with compressed claws. The dental characters are seen first in the supposed superior incisors. Unfortunately they have not yet been found in place in the cranium, but their association with a rodent type of inferior incisors, which have been found in place in the mandible, confines us to the alternative choice between superior incisors and canines. From the small size or absence of inferior canines a similar character may be inferred for the superior canines.

The superior incisors present two bands of enamel, an anterior and a posterior. They are compressed in form, the sides presenting a surface of dentine or cementum. Attrition produces a truncate or slightly concave extremity. The inferior incisors are rodent-like.

Two families represented this suborder in the Eocene period in New Mexico. The first, or *Ectoganidæ*, possessed molar teeth with several roots; in the *Calamodontidæ*, each molar has a simple conic fang. But one genus of each family is known. In both the enamel of the molars is principally a band on the outer side of the crown; the deficiency is supplied in *Calamodon* by a deposit of cementum which invests the molar and superior incisor teeth, covering the crowns excepting where the enamel bands are present. The latter investment is so much thinner that the cementum forms a raised border all round at the point of junction of the two substances. The general structure of *Calamodon* affords some points of approximation to the *Edentata*, which indicate that the *Tæniodonta* partially fill the interval between that order and the *Edentata* presented by the existing fauna.

Professor Cope also pointed out the close resemblance between the mandibular dentition of the contemporary Eocene genus *Esthonyx* and the existing *Erinaceus*, and stated that *Anchippodus* and allies chiefly differ from *Esthonyx* in the persistent growth of the incisor teeth.[1]

GEOGRAPHY AND EXPLORATION.

PERUVIAN GEOGRAPHY. — The publication of the preliminary volume of Don Antonio Raimondi's great work, El Peru, will be, says a writer in the *Geographical Magazine*, an epoch in the history of Peruvian geographical research. This accomplished and indefatigable geographer and naturalist had traveled over every part of the republic, on a fixed plan, during a space of nineteen years, diligently collecting materials be-

[1] See On the Supposed Carnivora of the Eocene of the Rocky Mountains, Proceedings of the Philadelphia Academy of Natural Sciences, December, 1875.

fore he sat down to prepare his great scientific work on Peru for publication. This first volume is the key to the whole work, for it describes the methods and instruments used in the various branches of science, and contains a most interesting personal narrative of the author's numerous journeys, during nineteen years, over the length and breadth of the land. The work itself will consist of six parts. The first will be devoted to geography and meteorology, the second to geology, the third to mineralogy, the fourth and fifth parts to botany and zoölogy, and the sixth and last to ethnology, including descriptions of the architectural remains, pottery, arms, etc., of the different Peruvian tribes.

Recent Rise of the Peruvian Coast. — Interesting illustrations of the comparatively recent change in the coast level of Peru and the geographical changes resulting, are afforded by Mr. A. Agassiz in the last Bulletin of the Museum of Comparative Zoölogy. A number of corals were found by him at the height of from 2900 to 3000 feet above the level of the sea, at a distance in a straight line from the Pacific Ocean of twenty miles. From the general features of the country along the coast of Peru, it requires but little imagination to reconstruct the former internal sea formed by the Coast Range, which must have, within comparatively recent geological times, covered the whole of the great nitrate basin of Peru, and which has gradually been elevated to its present position. This inland sea then became a salt lake, afterwards a lagoon, and finally was entirely drained. While Darwin showed that beyond doubt the coast of South America has been recently elevated 800 feet, Mr. Agassiz believes that the elevation reached an altitude of at least 2900 feet, and in earlier times, judging by the marine nature of the fauna of Lake Titicaca, to an elevation of 12,500 feet.

MICROSCOPY.[1]

The Limits of Microscopic Vision. — In his recent annual address to the Microscopical Society of London, the president, Mr. H. C. Sorby, F. R. S., discusses the relation between the limits of the powers of the microscope and the size of the ultimate molecules of matter. As the combined result of observation and theory, he concludes that the normal limit of distinct visibility with the most perfect microscope is one half of the wave-length of the light. If so, even with the very best lenses (except under special conditions) light itself is of too coarse a nature to even enable us to define objects less than $\frac{1}{80000}$ to $\frac{1}{100000}$ of an inch apart. It would appear, therefore, that as far as this question is concerned, our microscopes have already reached their ultimate limit. Adopting the results as to the size of the ultimate molecules of matter arrived at by Mr. Stanley, Sir W. Thomson, and Professor Clerk-Maxwell, Mr. Sorby calculates that in the smallest interval which could be distinctly seen by the best possible microscope, there would be about

[1] This department is conducted by Dr. R. H. Ward, Troy, N. Y.